

WHAT IS CLAIMED IS:

- 1 1. A method for stylizing video, comprising:
2 performing a spatio-temporal segmentation analysis on the video to identify
3 three dimensional volumes of contiguous pixels having a similar characteristic;
4 receiving an input identifying a group of the three dimensional volumes;
5 and
6 identifying the group of three dimensional volumes as a single semantic
7 region.
- 8 2. The method of claim 1, wherein the similar characteristic comprises
9 color.
- 10 3. The method of claim 1, wherein the spatio-temporal segmentation
11 analysis comprises an anisotropic kernel mean shift segmentation procedure.
- 12 4. The method of claim 1, wherein the input comprises an interactive
13 user input.
- 14 5. The method of claim 1, wherein the three dimensional volumes of
15 contiguous pixels comprise segments.
- 16 6. The method of claim 5, wherein the user input comprises outlining a
17 plurality of segments.

18 7. The method of claim 6, wherein the outlining is performed on a
19 number of keyframes of the video, the number of keyframes being fewer than a total
20 number of frames of the video.

21 8. The method of claim 7, wherein additional segments on frames of
22 the video other than keyframes are identified by determining a relationship of the
23 additional segments to the segments outlined on the keyframes.

24 9. The method of claim 8, wherein the relationship comprises at least a
25 portion of the additional segments being enclosed by one or more of the segments
26 outlined on the keyframes.

27 10. The method of claim 9, wherein the at least a portion comprises at
28 least a majority of pixels of the additional segments.

29 11. The method of claim 1, further comprising applying a stylization to
30 the single semantic region.

31 12. The method of claim 11, wherein the stylization comprises a mean
32 shift technique.

33 13. A computer-readable medium having computer-executable
34 instructions for stylizing video, the instructions comprising:
35 performing a spatio-temporal segmentation analysis on the video to identify
36 three dimensional volumes of contiguous pixels having a similar characteristic;
37 receiving an input identifying a group of the three dimensional volumes;
38 and
39 identifying the group of three dimensional volumes as a single semantic
40 region.

41 14. The computer-readable medium of claim 13, wherein the
42 instructions further comprise deriving a set of edge sheets that represent the surface of the
43 single semantic region and associating the edge sheets with the semantic region.

44 15. The computer-readable medium of claim 14, further comprising
45 rendering the edge sheets as a curve between the semantic region and another portion of
46 the video.

47 16. The computer-readable medium of claim 14, wherein a thickness of
48 the edge sheets is determined based on criteria associated with the single semantic region.

49 17. The computer-readable medium of claim 16, wherein the criteria
50 comprises a position of the edge sheet relative to an arclength of the edge sheet.

51 18. The computer-readable medium of claim 16, wherein the criteria
52 comprises a duration of existence of the semantic region in the video.

53 19. The computer-readable medium of claim 16, wherein the criteria
54 comprises a movement of the semantic region in the video.

55 20. A computer-readable medium having computer-executable
56 instructions for stylizing video, the instructions comprising:

57 determining a set of volumetric objects by mean shift video segmentation,
58 each volumetric object being a segment;

59 indicating on a limited number of keyframes how segments should be
60 merged into a semantic region; and

61 interpolating the indications between keyframes by a mean shift
62 constrained interpolation technique to propagate the indication to frames between
63 keyframes.

64 21. The computer-readable medium of claim 20, further comprising
65 drawing paint strokes within the semantic region at keyframes.

66 22. The computer-readable medium of claim 21, wherein the paint
67 strokes are similarly interpolated.

68 23. The computer-readable medium of claim 20, wherein a surface of
69 the semantic region is smoothed.

70 24. The computer-readable medium of claim 20, wherein an edge sheet
71 is determined that corresponds to a surface of the semantic region.

72 25. The computer-readable medium of claim 20, wherein a stroke sheet
73 is determined that corresponds to a surface lying within the semantic region